

## REMARKS

Applicants have carefully reviewed the Board's Decision on Appeal dated January 19, 2010 (hereinafter "the Decision"). Claims 1-29 and 31-34 are pending in this application. In the Decision, the Board reversed the rejections of claims 19-29 and 31-34. As such, claims 19-29 and 31-34 do not stand rejected under any ground, and Appellants submit that those claims are in condition for allowance.

In the Decision, the Board affirmed the rejection of claims 1-18 as being unpatentable under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 3,584,850 issued to Brandvold (hereinafter "Brandvold") in view of U.S. Patent No. 5,413,476 issued to Baukal, Jr. et al. (hereinafter "Baukal"). In the Decision on Request for Rehearing dated April 21, 2010, the Board denominated the affirmed rejection as a new ground of rejection of claims 1-18.

By this amendment, Applicants have amended claims 1, 7, and 14. Applicants respectfully request reconsideration of this application in light of the amendments presented above and the remarks presented below. Applicants respectfully request reconsideration of this application in light of the amendments presented above and the remarks presented below.

### **Rejections under 35 U.S.C. § 103(a)**

#### **Re: claims 1, 7, and 14**

As discussed above, claims 1-18 stand rejection under Section 103 as being unpatentable over Brandvold in view of Baukal. On pages 8-12 of the Request for Rehearing dated March 19, 2010, Applicants argued that the Board's decision misapprehended or overlooked the basic operation of Brandvold's kiln in order to find the claimed invention obvious. Applicants respectfully maintain that is the case; however, in the interest of expediting prosecution of claims 1-18, Appellants have amended independent claims 1, 7, and 14. Each of claims 1, 7, and 14 now require introducing additional combustion air into "the rotary vessel at a location *downstream, relative to a kiln gas stream, of the flame*" of the rotary kiln between the lower end and the upper end of the rotary vessel. In light of those amendments, Applicants respectfully assert that the rejection of claims 1, 7, and 14 should be withdrawn.

On pages 11 and 12 of the Board's decision, the Board found in reference to claim 1 that

One of ordinary skill in the art would understand that when incorporating Baukal's teachings into the device of Brandvold, it would not be necessary to incorporate the specific location of the secondary air injection of either reference as Appellants suggest. Combining the teachings of references does not mandate combination of their specific structures. In re Nievelt, 482 F.2d 965, 968 (CCPA 1973). One of ordinary skill in the art would recognize that, while the location of the injected oxygen may affect NO<sub>x</sub> emissions, reducing the oxygen to fuel ratio in the burner could reduce NO<sub>x</sub> emission independent of the location of the injection. See Fact 9. Furthermore, one of ordinary skill in the art would recognize that the location of the secondary air need not be confined to Brandvold's tuyere location. One of ordinary skill in the art would understand how to properly locate the injected air in order to implement Baukal's teachings. Even if a location proximate the flames were required as Appellants suggest, such a location would still meet the claim which merely requires introducing additional combustion air between the vessel's ends.

(emphasis added). As the Board noted, the original claim 1 recited only that the additional combustion air is introduced "through an opening in a wall of the rotary vessel at a location between the lower end of the rotary vessel and an upper end of the rotary vessel." Amended claim 1, as well as amended claims 7 and 14, now requires the introduction of the additional combustion air at a specific location downstream, relative to a kiln gas stream, of the flame of the rotary vessel. Applicants respectfully submit that Baukal teaches away from the claimed method and therefore do not render the claimed method obvious.

*KSR Int'l. v. Teleflex* reaffirmed that certain principles govern the analysis of obviousness. See 550 U.S. 398 (2007). The *KSR* Court emphasized the "principle that when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious." *KSR*, 550 U.S. at 416 (citing *U.S. v. Adams*, 383 U.S. 39, 51-52 (1966)). In applying this principle, any analysis of obviousness must consider the prior art "in its entirety, *i.e., as a whole*, including portions that would lead away from the claimed invention." *W.L. Gore & Assoc. v. Garlock*, 721 F.2d 1540, 1550-51 (Fed. Cir. 1983) (emphasis added). In this case, Baukal specifically requires introducing a secondary oxygen stream into the flame, not at a location downstream from the flame as required by amended claims 1, 7, and 14.

As such, even if a person of ordinary skill were to implement Baukal's teachings in Brandvold's kiln, a person of ordinary skill would not locate Baukal's secondary oxygen stream

downstream of the flame. Instead, a person of ordinary skill would follow Baukal's teaching set forth at col. 4, lines 36-46, which states:

The location of oxygen introduction into the flame is critical, and test furnace experiments later described showed that the oxygen must be introduced directly into the visible flame at a distance  $x$ , where  $x$  is measured from the burner discharge point in an axial direction, such that  $x/L$  is at least about 0.3,  $L$  being the total length of the visible flame produced by the burner as measured from the burner discharge point to the tip of the flame. The upper limit of  $x/L$  is about 0.8, beyond which NOX formation begins to increase above that of conventional air-based burners.

(emphasis added). According to the express teaching of Baukal's own disclosure, Baukal's flame system will not function if the secondary oxygen stream is not introduced directly into the visible flame. As such, no one skilled in the art would be motivated to make the claimed invention from the proposed combination because Baukal teaches that the resulting device would simply have not worked.

When Baukal's disclosure is properly considered "in its entirety, *i.e., as a whole*, including portions that would lead away from the claimed invention," Applicants respectfully submit that a person of ordinary skill would be led away from introducing additional combustion air "at a location *downstream, relative to a kiln gas stream, of the flame*" as required by amended claims 1, 7, and 14. For at least that reason, the combination of Baukal and Brandvold fails to render claims 1, 7, and 14, and Applicants respectfully ask that the rejection of those claims be withdrawn.

#### Re: claims 8 and 13

Claims 8 and 13 depend from claim 7. As discussed herein, Applicants believe that the amended claim 7 is not obvious under Section 103. Applicants therefore ask that the rejection of claims 8 and 13 should be withdrawn for at least the reasons hereinbefore discussed with regard to claim 7. See *In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) ("Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious."). Additionally, claims 8 and 13 require the introduction of additional combustion air at a location within the calcining zone of the rotary vessel. Applicants respectfully submit that Brandvold and Baukal that both references teach away from the claimed method and therefore do not render the claimed method obvious.

At col. 6, lines 55-75, Brandvold specifically teaches and requires introducing additional air in the drying zone at the upper end of the kiln. Baukal, on the other hand, specifically requires introducing a secondary oxygen stream into the flame at the lower end of the kiln. Applicants therefore assert that introducing additional combustion air at a location within the calcining zone is simply contrary to the teachings of Baukal and Brandvold. For that additional reason, a person of ordinary skill would be led away from the claimed invention, and Applicants ask that the rejection of claims 8 and 13 be withdrawn.

Re: claims 2-6, 9-12, and 15-18

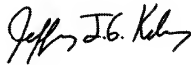
Claims 2-6, 9-12, and 15-18 depend from claims 1, 7, and 14. As discussed herein, Applicants believe that the amended claims 1, 7, and 14 are not obvious under Section 103. As a result, Applicants submit that the Examiner should withdraw the rejection of 2-6, 9-12, and 15-18 for the reasons hereinbefore discussed with regard to claims 1, 7, and 14. In light of the overwhelming reasons for the withdrawal of the rejection of claims 1, 7, and 14, Applicants hold any arguments specific to claims 2-6, 9-12, and 15-18 in abeyance without prejudice or admission to any assertion made by the Examiner in order to expedite prosecution.

**Conclusion**

In view of the foregoing remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants herby solicit to action to that end.

Applicants further respectfully ask the Office to consider this paper a Petition for an Extension of Time sufficient to effect a timely response and ask that shortages in other fees be charged or any overpayment in fees be credited to the Account of Barnes & Thornburg, Deposit Account No. 10-0435 with reference to file 204560-73806.

Respectfully submitted,  
BARNES & THORNBURG LLP



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